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INDUSTRI-PLEX SITE

REMEDIAL TRUST

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February 22, 2000

Mr. Michael McAteer
U. S. EPA - Region 5
77 West Jackson Boulevard (SR-6J)
Chicago, Illinois 60604-3590

Re: Sauget Sites Area I January 21, 1999 Administrative Order by Consent
• **Absence of crayfish in the Borrow Pit and reference locations**

Dear Mr. McAteer,

Pursuant to the Sauget Sites Area I Support Sampling Plan and prior to the reconnaissance and field sampling program for Sauget Sites Area I, crayfish were included among the species to be sampled for analysis. However, no crayfish were found in the sampling areas despite an extensive search in the Borrow Pit as well as both reference locations. In respond to your enquiry as to the likely reasons why no crayfish were found in these locations, enclosed is a report from Menzie-Cura & Associates, detailing the habitat conditions that are most favorable to crayfish populations compared to those actual conditions existing at the Site, which appear to provide insufficient habitat for crayfish.

Please call if you have additional questions.

Sincerely,

D. M. Light
Manager, Remedial Projects
Solutia Inc.

cc:

B. Yare - Solutia Inc.
C. Menzie - M/C
K. Perry - Solutia Inc.

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Memorandum

FROM: Kenneth Cerreto
TO: Bruce Yare (Solutia) and Charlie Menzie
DATE: Tuesday, February 22, 2000
SUBJECT: Crayfish Absence from Borrow Pit of Sauget, Area I
JOB #: 648 B

This memorandum provides information regarding the observed absence of crayfish in the Borrow Pit.

Prior to the reconnaissance survey and field sampling program for the Dead Creek in Sauget, Illinois, crayfish were included among the organisms to be sampled for analysis. It was assumed that crayfish would be present prior to a site visit. During both the reconnaissance survey and the field sampling program, no crayfish were found despite an extensive search in the Borrow Pit and both reference locations. In these three locations, beach seining was performed multiple times in a manner which plowed through the top few inches of sediment. This method of seining captured various benthic invertebrates, such as clams, shrimp, and odonates, yet no crayfish were netted. The absence of crayfish from the study area *and* both reference locations suggests that these water bodies provided insufficient habitat for crayfish.

Habitat

Crayfish occupy a gamut of habitats from meadows devoid of water bodies to small stony riffles. They also occupy small, muddy water bodies, lakes, and rivers. Individual species, however, tend to have "specific habitat requirements". Substrate is a major factor in crayfish distribution. Rocky substrate was shown to be significantly preferred to a mud/clay substrate by *Pacifastacus leniusculus* living in the Sacramento River. In a single transect crossing the Sacramento where one shore was rocky and the other mud/clay, 87% of trapped crayfish were from the rocky side (Shimizu and Goldman, 1981). Abrahamsson (1981) found "boulders on top of gravel" was preferred by both *P. leniusculus* and *Astacus astacus* since it provides numerous crevices for predator avoidance and also traps detritus and other food items. For these same two species of crayfish, Odelstrom (1981) found that juveniles thrive mainly in rocks and gravel only. Finally, Klosterman and Goldman (1981) clearly demonstrated that *P. leniusculus* has a clear preference for a mixed substrate of cobbles, pebbles, and sand and gravel over sand and gravel alone.

While crayfish are considered scavengers of an undiscerning palate, they do prefer aquatic vegetation to other types of food (Pennak, 1989). The predominant plant species in the area was the creeping buttercup, *Ranunculus reptans*. This plant was not found growing in the water but on exposed banks. Dead Creek, the Borrow Pit, and both reference locations were lacking in many common aquatic plants.

Some species of crayfish leave the water in late summer when the water level begins to drop and/or temperatures decrease. They construct burrows by tunneling into the earth and remain there until the water levels rise again and/or temperatures increase (Pennak, 1989). A burrowing crayfish usually inhabits "bottom lands" where the water table is high enough to keep the burrow's chamber – the lowest point of the burrow – moist. This is done in order to provide enough moisture for respiration (Barnes, 1974). While crayfish chimneys were not observed in the field, the water bodies studied certainly showed signs of decreasing water level and temperatures were consistently cool, as expected for October.

Sampling Techniques

Huxley (1879) points out that crayfish are "intolerant of great heat and of much sunshine", suggesting nocturnal foraging excursions. The bulk of sampling was done during the day, a time crayfish spend in their burrows. Gillnets and minnow traps were set overnight but no crayfish were caught. Digging for crayfish was not

performed since there was no evidence of crayfish chimneys; the excavated earth carried to the surface by a burrowing crayfish.

"...even where [crayfish] are known to abound, it is not easy to find them at all times of the year."
(T.H. Huxley, 1879)

SOURCES

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